Recordex
CORPORATION

130-145
SERVICE MANUAL

145 -130 DUPLICATORS

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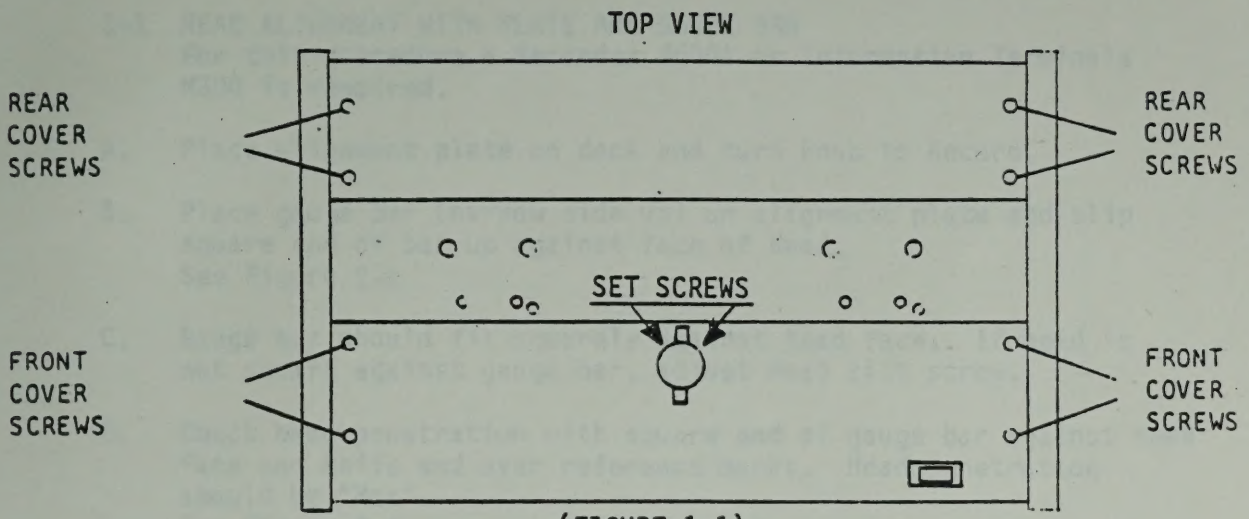
SECTION 1
REMOVAL OF CABINET

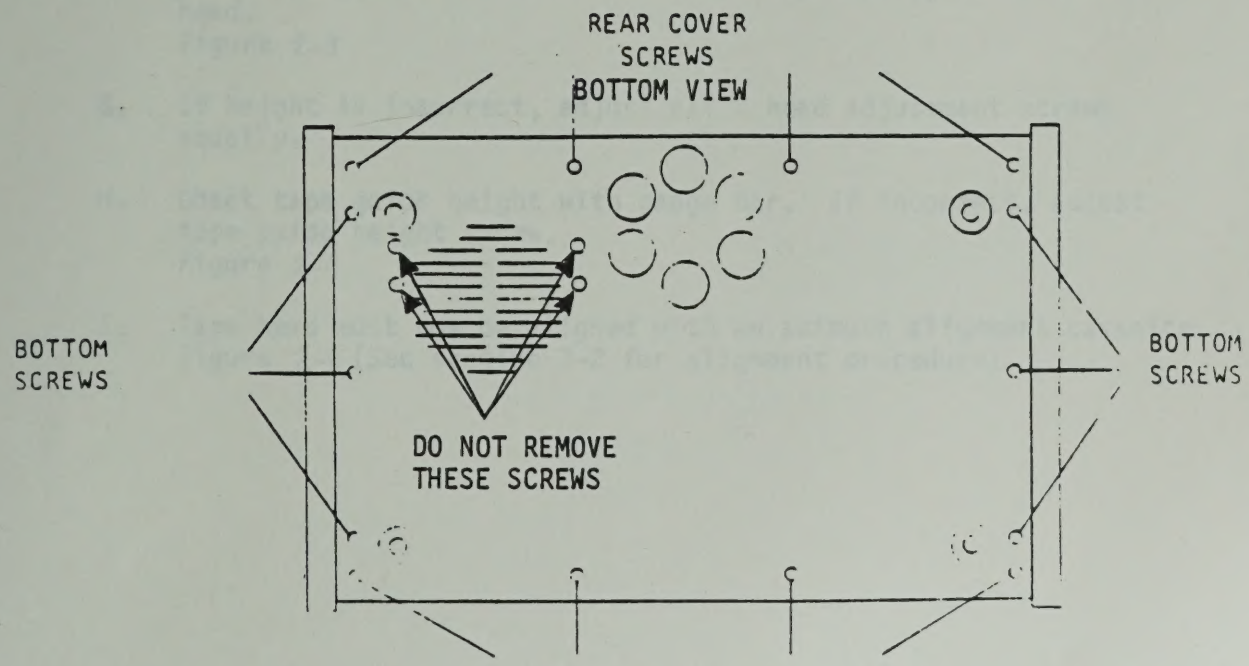
A. BOTTOM:
Place the 145/130 on its left end. Remove the 14 bottom retaining screws (DO NOT remove the 4 screws that attach the fan to the bottom). Disconnect the fan motor plug.
See figure 1-2

B. REAR COVER:
Place the 145/130 on its bottom. Remove the 4 rear cover retaining screws located on the top surface of the cover.
See Figure 1-1

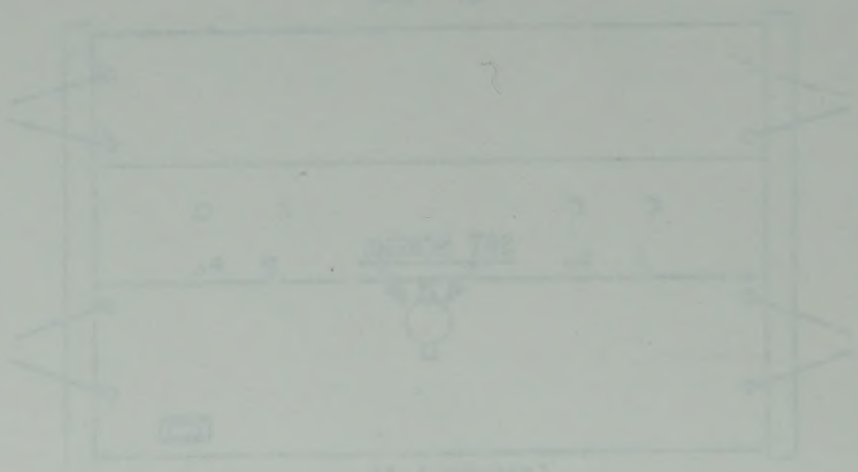
C. FRONT COVER:
Remove the knob, using a 1/16" hex wrench. Remove the 4 front cover retaining screws located on the top surface of the cover. Lift the cover about 3 inches and remove the Push-On terminals from the On-Off switch. Remove the On-Off switch from the cover (squeeze the retaining clips on the ends of the switch and push the switch through the cover). Connect the Push-On terminals to the switch (this will allow the 145/130 to run with the front cover removed). Install the knob.
See Figure 1-1



(FIGURE 1-1)



(FIGURE 1-2)



SECTION 2

HEAD ALIGNMENT

3-1 HEAD ALIGNMENT WITH PLATE AND GAUGE BAR
For this procedure a Recordex 96001 or Information Terminals M300 is required.

A. Place alignment plate on deck and turn knob to Record.

B. Place gauge bar (narrow side up) on alignment plate and slip square end of bar up against face of head.
See Figure 2-1

C. Gauge bar should fit squarely against head face. If head is not square against gauge bar, adjust head tilt screw.

D. Check head penetration with square end of gauge bar against head face and knife end over reference marks. Head penetration should be "Max".
See Figure 2-2

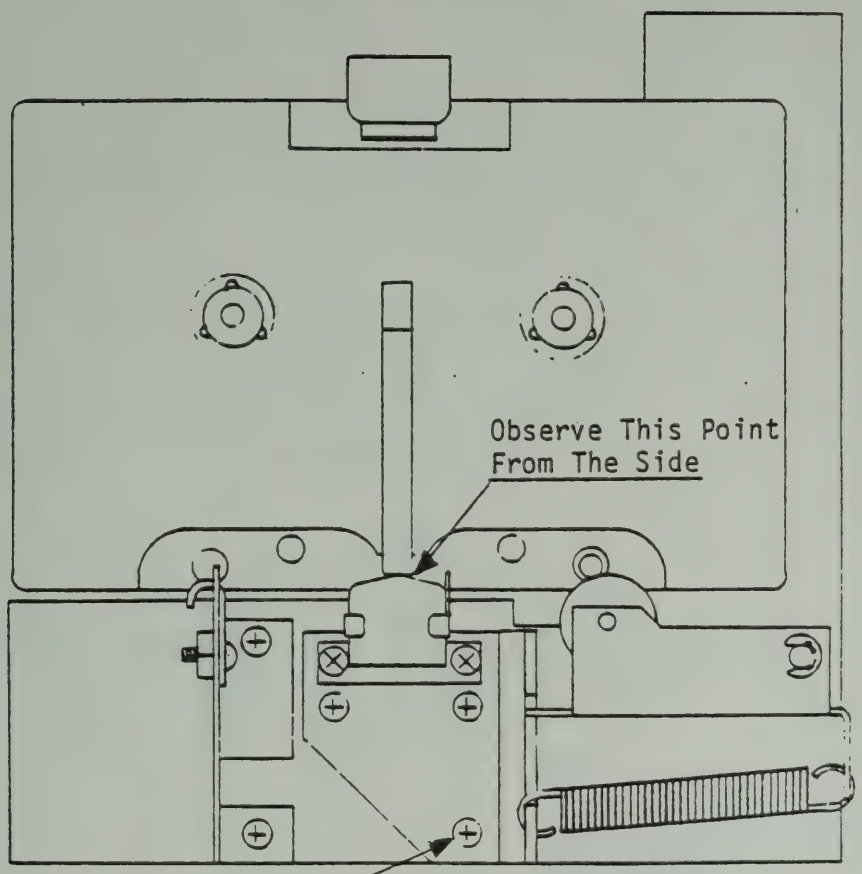
E. If head penetration is incorrect, adjust head plate linkage underneath deck. See Figure 3-2 (Page 13)

F. Check tape head height with gauge bar (wide side up). Square end of gauge bar should slip freely into tape guide on side of head.
Figure 2-3

G. If height is incorrect, adjust all 3 head adjustment screws equally.

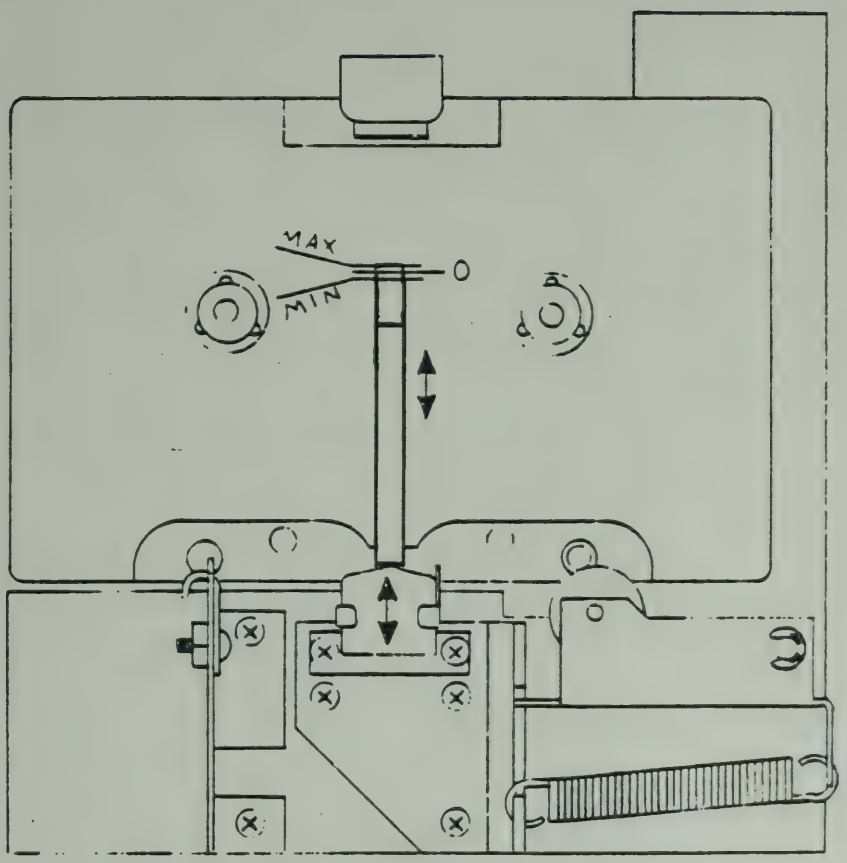
H. Check tape guide height with gauge bar. If incorrect, adjust tape guide height screw.
Figure 2-4

I. Tape head must now be aligned with an azimuth alignment cassette.
Figure 2-4 (See section 3-2 for alignment procedure)

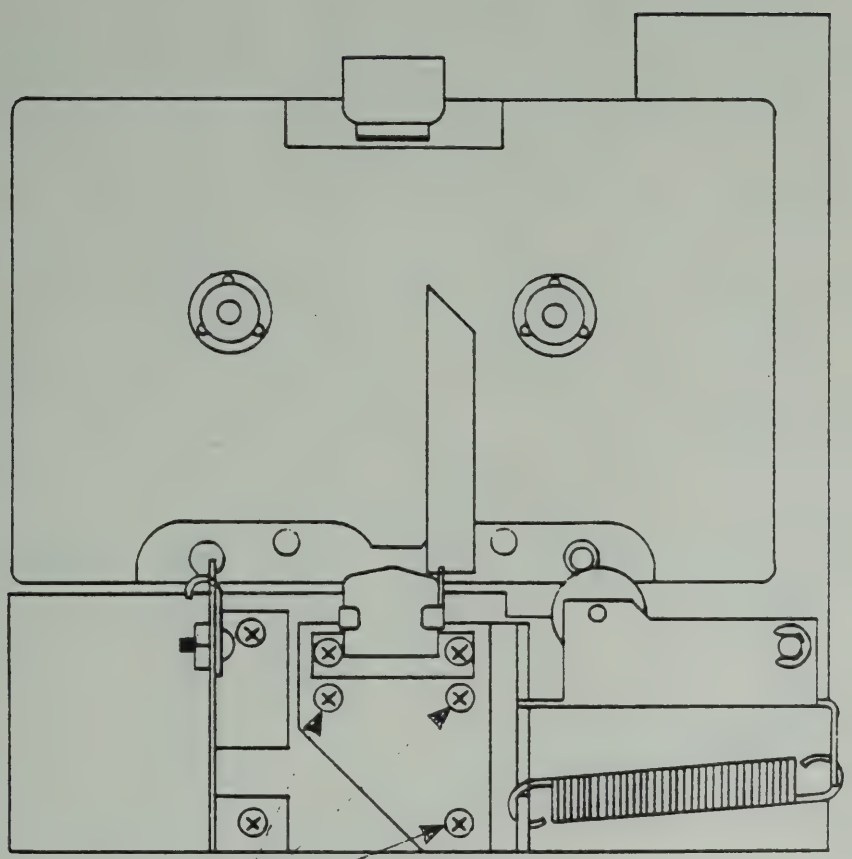


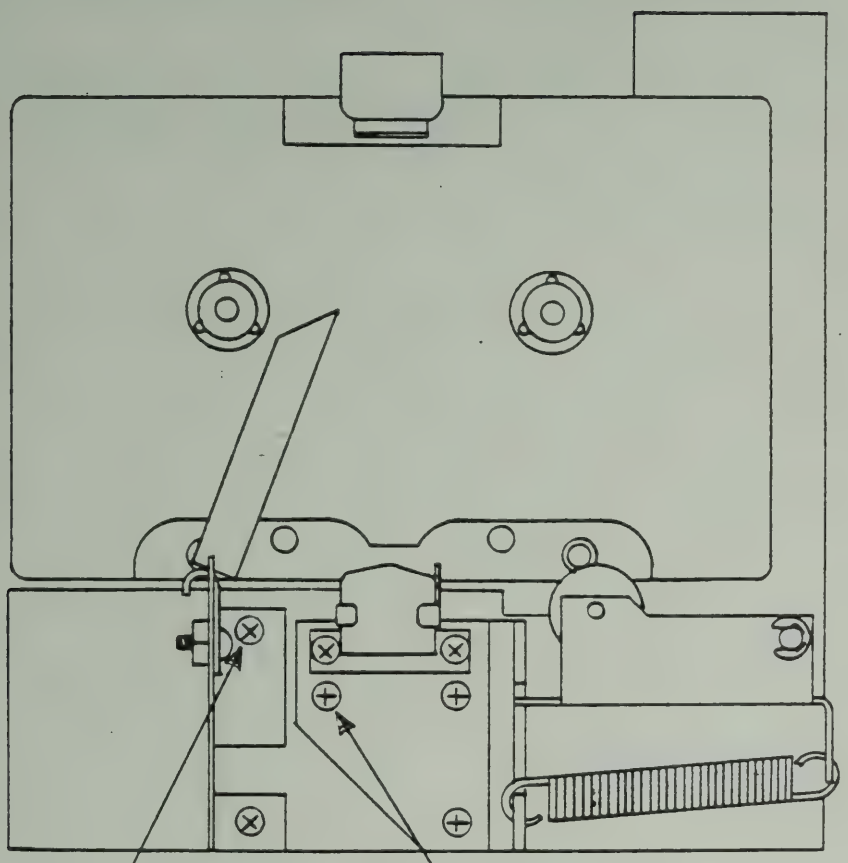
HEAD TILT ADJUSTMENT
(FIGURE 2-1)

Adjust This Screw
(Head Tilt Screw)



HEAD PENETRATION ADJUSTMENT
(FIGURE 2-2)


HEAD HEIGHT ADJUSTMENT
(FIGURE 2-3)
Adjust These 3
Screws Equally



(FIGURE 2-4)

TAPE
GUIDE
HEIGHT
SCREW

HEAD
AZIMUTH
SCREW

3-2 HEAD AZIMUTH ALIGNMENT

For this procedure an azimuth alignment cassette and an A C voltmeter are required.

A. Switch A C voltmeter to 5 volts (or less) scale. Connect common lead of voltmeter to 145/130 chassis, connect other lead of voltmeter to amplifier output (test point 1) on AMP-Mixer P.C. board.

B. Place azimuth cassette on master (left) deck. Turn knob to Record position. Adjust azimuth screw for maximum voltmeter indication. Lower level "Peaks" will occur on each side of maximum peak, so be sure maximum voltmeter indication is obtained. See Figure 2-4

C. Disconnect master head plug. Disconnect record head plug and connect to one end of 89046 head lead extension. Connect other end of head lead extension to master head plug.

D. Place azimuth cassette on record (right) deck. Turn knob to Record position. Adjust azimuth screw for maximum voltmeter indication. See Figure 2-4

SECTION 3

BELT REPLACEMENT

A. Remove auto stop pick-up assembly from master deck.

B. Remove capstan thrust plate from record deck.

C. Remove retaining ring and nylon washer from linkage at head plate.

D. Remove both above deck drive belts.

E. Pull end of record capstan belt over large end of flywheel and over rewind clutch pulley.

F. Slip other end of belt over top of motor pulley and up through top of deck.

G. Pull end of master capstan belt over large end of flywheel.

H. Slip other end of belt over top of motor pulley and up through top of deck.

I. Replace master capstan belt (Part #88153).

J. Replace record capstan belt (Part #88156).

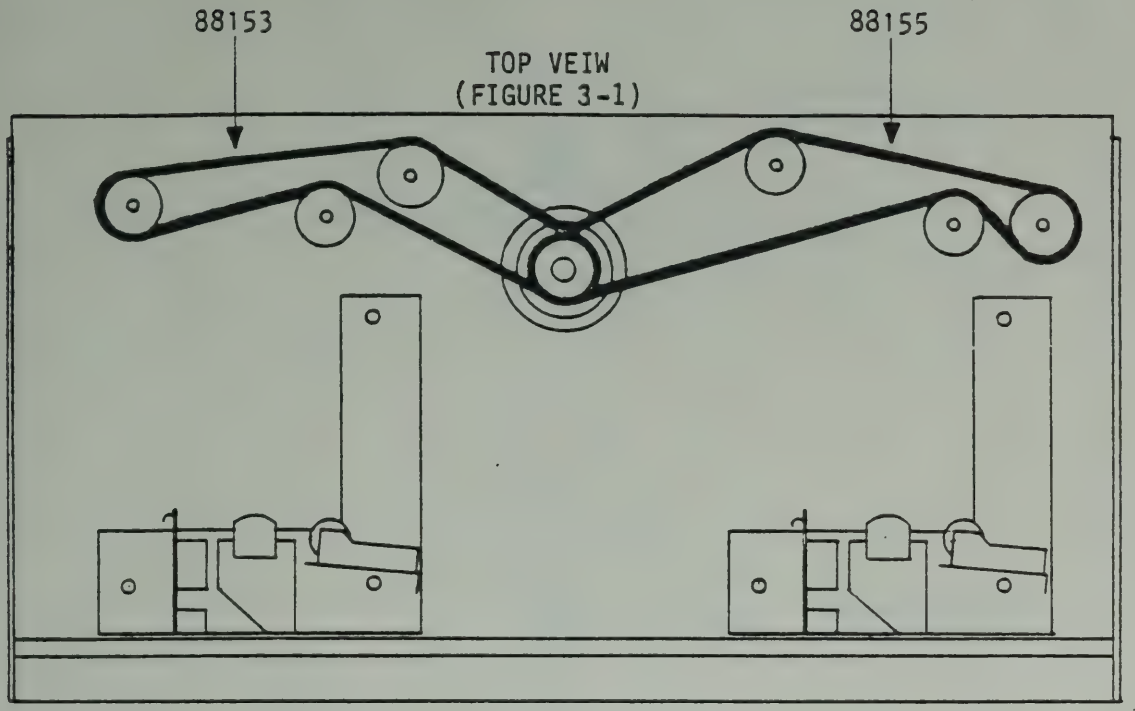
K. Replace linkage, nylon washer and retaining ring at head plate.

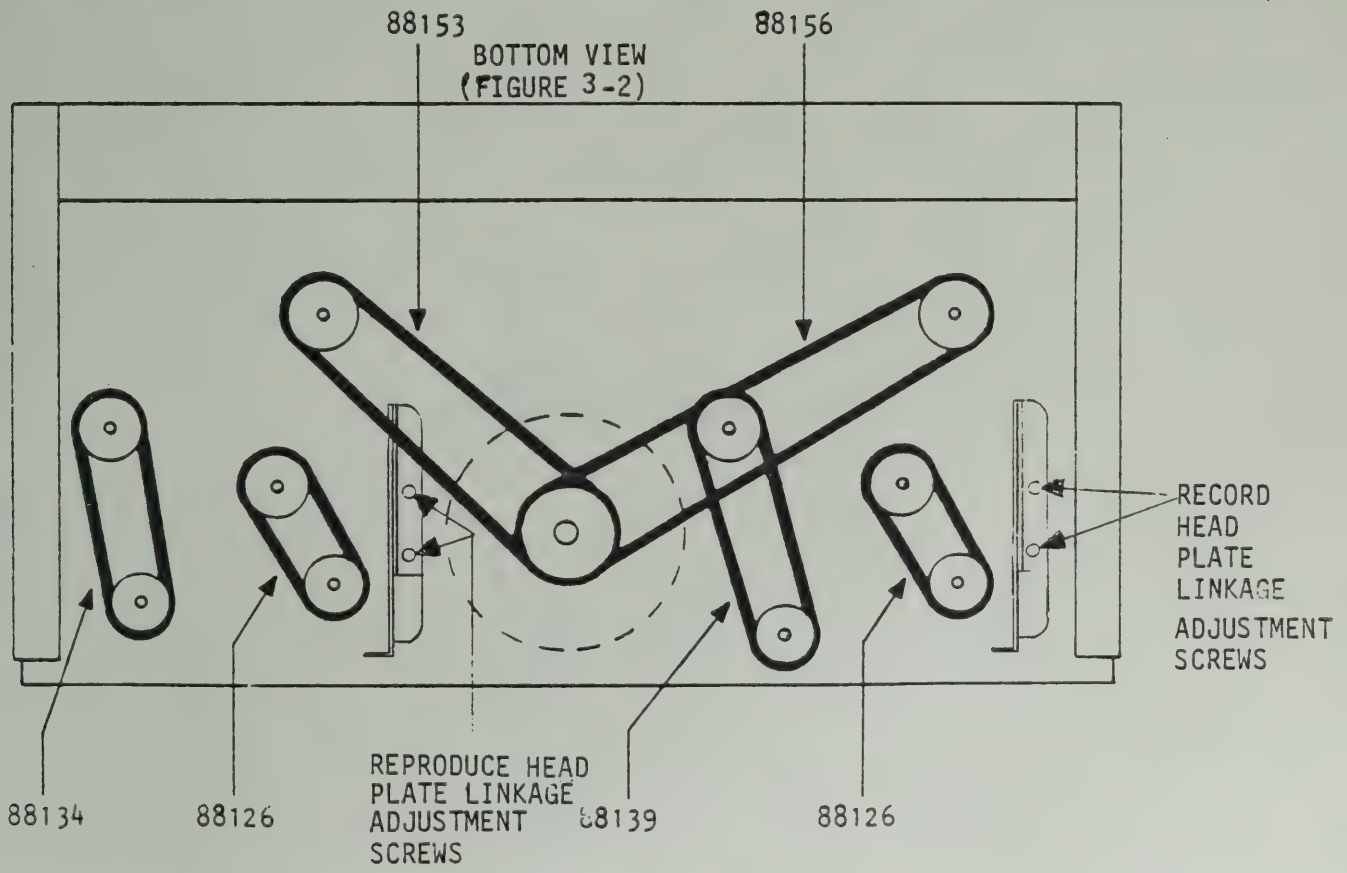
L. Replace capstan thrust plate and auto stop pick-up assembly.

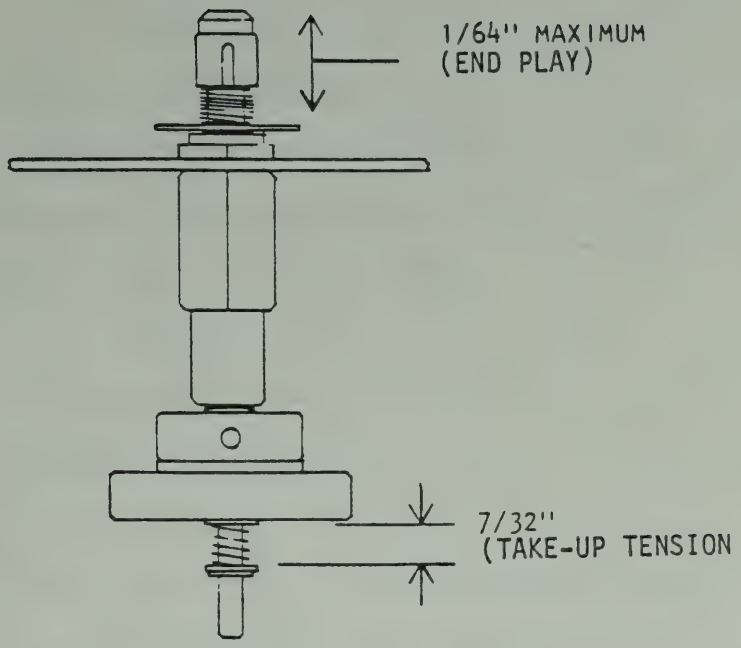
M. Replace above deck drive belts (Part #88153/88155).

N. Replace both take-up belts (Part #88126).

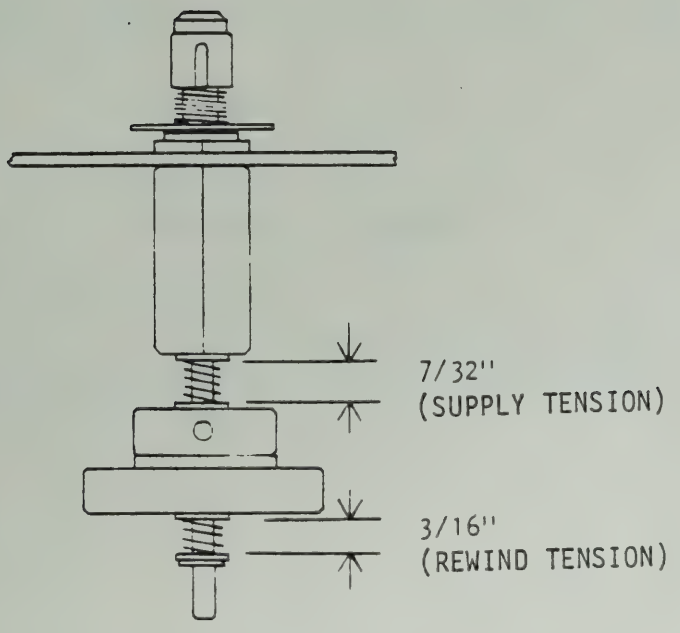
O. Replace both rewind belts (Part #88139).


88153
88155
TOP VEIW
(FIGURE 3-1)


88153
88156
BOTTOM VIEW
(FIGURE 3-2)
RECORD
HEAD
PLATE
LINKAGE
ADJUSTMENT
SCREWS
88134
88126
REPRODUCE HEAD
PLATE LINKAGE
ADJUSTMENT
SCREWS
88139
88126



TAKE-UP SHAFT
(FIGURE 5-1)



SUPPLY-REWIND SHAFT
(FIGURE 5-2)

SECTION 4

PINCH ROLLER REPLACEMENT

A. Remove retaining ring at top, right end of pinch roller arm.

B. Lift pinch roller arm off of shaft and unhook spring from arm.

C. Install new pinch roller arm in reverse order.

SECTION 5

CLUTCH ADJUSTMENT

TAKE-UP CLUTCH ADJUSTMENT (FIGURE 5-1)

A. Adjust end play to 1/64" maximum.

B. Remove photo dish from master take-up shaft using grip ring pliers.

C. Take-up tension should be adjusted using a torque cassette. Adjust clutch spring retaining ring to obtain a reading of 40 to 60 GR./CM.

D. If a torque cassette is not available, adjust compressed length of clutch spring to 7/32".

REWIND CLUTCH ADJUSTMENT (FIGURE 5-2)

A. Adjust white spindle pulley to obtain a hold-back spring compressed length of 7/32". The shaft should have a slight amount of drag as it is rotated.

B. Adjust clutch spring retaining ring to obtain a clutch spring compressed length of 3/16".

SECTION 6

BIAS ADJUSTMENT

FOR THIS PROCEDURE AN A C VOLTMETER IS REQUIRED

A. Switch voltmeter to 50 volt scale.

B. Connect common lead of voltmeter to 145/130 chassis. Connect other lead of voltmeter to bias bus (test point 3) on Amp-Mixer P.C. board.(See Page 29 for test point location).

C. Adjust bias level control for a voltmeter indication of 26 volts RMS.

SECTION 8

RECORD LEVEL ADJUSTMENT

FOR THIS PROCEDURE A RECORDEX 89083 LEVEL CASSETTE AND AN A C VOLTMETER ARE REQUIRED

A. Switch voltmeter to 5 volts or less scale.

B. Connect common lead of voltmeter to 145/130 chassis.

C. Connect other lead of voltmeter to channel 1 output (test point 1) on AMP-Mixer P.C. board. (See Page 29 for test point location).

D. Place level cassette on master deck and turn knob to record.

E. Adjust channel 1 level trimmer (R14) for a voltmeter indication of .55 volts RMS (See Page 29 for R-51 location).

F. Connect voltmeter lead to channel 2 output (test point 2) on AMP-Mixer P.C. board.

G. Adjust channel 2 level trimmer (R51) for voltmeter indication of .55 volts RMS (See Page 29 for R-51 location).

H. Double check levels by making a copy of level cassette 89083 onto copy tape of the same type to be used in normal duplication.

I. After completing copy or part of it, compare level cassette VU reading to copy tape VU reading on a player of reliable quality with VU meters.

J. Make minor trimmer adjustments if required and repeat steps H through J until a difference of ± 2DB is obtained for each channel, between master and copy.

SECTION 8 PARTS LIST

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
R 1	RESISTOR - 1 MEG. OHM, 10%, ½W.	81522	
R 2	RESISTOR - 8.2K. OHM, 10%, ½W.	81514	
R 3	RESISTOR - 10K. OHM,10%, ½W.	81515	
R 4	RESISTOR - 100K. OHM, 10%, ½W.	81520	
R 5	RESISTOR - 470K. OHM, 10% ½W.	81521	
R 6	RESISTOR - 6.8K. OHM, 10% ½W.	81513	
R 7	RESISTOR - 2.2K OHM, 10% ½W.	81509	
R 8	RESISTOR - 100 OHM, 10%, ½W.	81502	
R 9	SAME AS R 7		
R 10	SAME AS R 5		
R 11	SAME AS R 5		
R 12	SAME AS R 6		
R 13	RESISTOR - 1K. OHM, 10%, ½W.	81506	
R 14	TRIMMER 10K	83103	
R 15	SAME AS R 6		
R 16	RESISTOR - 330K. OHM, 10% ½W.	81523	
R 17	RESISTOR - 390 OHM, 10% ½W.	81503	
R 18	SAME AS R 6		
R 19	RESISTOR - 1.5K. OHM, 10%, ½W.	81507	
R 20	SAME AS R 8		

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
R 21	SAME AS R 4		
R 22	SAME AS R 3		
R 23	SAME AS R 3		
R 24	SAME AS R 19		
R 25	SAME AS R 8		
R 26	RESISTOR - 3.3K, OHM, 10%, ½W.	81510	
R 27	RESISTOR - 22K, OHM, 10%	81517	
R 28	SAME AS R 3		
R 29	RESISTOR - 360K, PHM, 5% ½W.	81404	
R 30	SAME AS R 6		
R 31	SAME AS R 27		
R 32	RESISTOR - 680 OHM, 10%, ½W	81505	
R 33	SAME AS R 13		
R 34	SAME AS R 26		
R 35	RESISTOR - 27K. OHM, 10%, ½W.	81518	
R 36	RESISTOR - 10 PHM, 10%, ½W.	81501	
R 37	SAME AS R 36		
R 38	SAME AS R 7		
R 39	SAME AS R 8		
R 40	SAME AS R 1		

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
R 41	SAME AS R 2		
R 42	SAME AS R 3		
R 43	SAME AS R 4		
R 44	SAME AS R 5		
R 45	SAME AS R 6		
R 46	SAME AS R 7		
R 47	SAME AS R 8		
R 48	SAME AS R 5		
R 49	SAME AS R 5		
R 50	SAME AS R 6		
R 51	SAME AS R 14		
R 52	SAME AS R 6		
R 53	SAME AS R 6		
R 54	SAME AS R 17		
R 55	SAME AS R 6		
R 56	SAME AS R 19		
R 57	SAME AS R 4		
R 58	SAME AS R 3		
R 59	SAME AS R 3		
R 60	SAME AS R 19		

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
R 61	SAME AS R 27		
R 62	SAME AS R 3		
R 63	SAME AS R 29		
R 64	SAME AS R 6		
R 65	SAME AS R 27		
R 66	SAME AS R 32		
R 67	SAME AS R 13		
R 68	SAME AS R 26		
R 69	SAME AS R 35		
R 70	SAME AS R 36		
R 71	SAME AS R 36		
R 72	RESISTOR - 4.7K, OHM, 10%, ½W.	81511	
R 73	SAME AS R 8		
R 74	SAME AS R 32		
R 75	SAME AS R 3		
R 76	SAME AS R 8		
R 77	RESISTOR - 47K, PHM, 10%, ½W.	81504	
R 78	SAME AS 77		
R 79	SAME AS R 3		
R 80	RESISTOR - 470 OHM, 10%, ½W.	81524	

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
R 81	SAME AS R 13		
R 82	SAME AS R 13		
R 83	SAME AS R 5		
R 84	RESISTOR - 390 OHM, 10%, 2W.	81105	
R 85	SAME AS R 27		
R 86	SAME AS R 3		
R 87	SAME AS R 77		
R 88	SAME AS R 6		
R 89	SAME AS R 6		
R 90	SAME AS R 27		
R 91	SAME AS R 13		
R 92	SAME AS R 3		
R 93	SAME AS R 3		
R 94	RESISTOR - 10 OHM, 10% 2W.	81101	
R 95	SAME AS R 94		
R 96	CONTROL POTENTIOMETER - 250 OHM	83212	MALLORY LW 250
C 1	CAPACITOR - MYLAR, .01 MFD, 100 VDC	82206	
C 2	CAPACITOR - ELECTROLYTIC, 2 MFD, 25 VDC	82401	
C 3	CAPACITOR - ELECTROLYTIC, 25 MFD, 25 VDC	82403	
C 4	CAPACITOR - MYLAR, .1 MFD, 100 VDC	82208	

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
C 5	CAPACITOR - MICA, 82 PFD	82501	
C 6	CAPACITOR - MYLAR, .0039 MFD, 600 VDC	82302	
C 7	SAME AS C 2		
C 8	CAPACITOR - MYLAR, 0047 MFD, 600 VDC	82303	
C 9	CAPACITOR - MYLAR, .22 MFD, 100 VDC	82209	
C 10	SAME AS C 4		
C 11	SAME AS C 4		
C 12	CAPACITOR - ELECTROLYTIC, 50 MFD, 50 VDC	82407	
C 13	SAME AS C 4		
C 14	CAPACITOR - MICA, 3000 PFD	82508	
C 15	SAME AS C 2		
C 16	SAME AS C 5		
C 17	SAME AS C 2		
C 18	SAME AS C 2		
C 19	SAME AS C 3		
C 20	SAME AS C 12		
C 21	SAME AS C 2		
C 22	CAPACITOR - MICA, 47 PFD	82512	
C 23	CAPACITOR - MICA, 240 PFD	82505	
C 24	SAME AS C 1		

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
C 23	CAPACITOR - MICA, 240 PFD	82505	
C 24	SAME AS C 1		
C 25	SAME AS C 2		
C 26	SAME AS C 4		
C 27	SAME AS C 5		
C 28	SAME AS C 6		
C 29	SAME AS C 3		
C 30	SAME AS C 2		
C 31	SAME AS C 8		
C 32	SAME AS C 9		
C 33	SAME AS C 4		
C 34	SAME AS C 3		
C 35	SAME AS C 4		
C 36	SAME AS C 14		
C 37	SAME AS C 4		
C 38	SAME AS C 2		
C 39	SAME AS C 2		
C 40	SAME AS C 2		
C 41	SAME AS C 3		
C 42	SAME AS C 2		

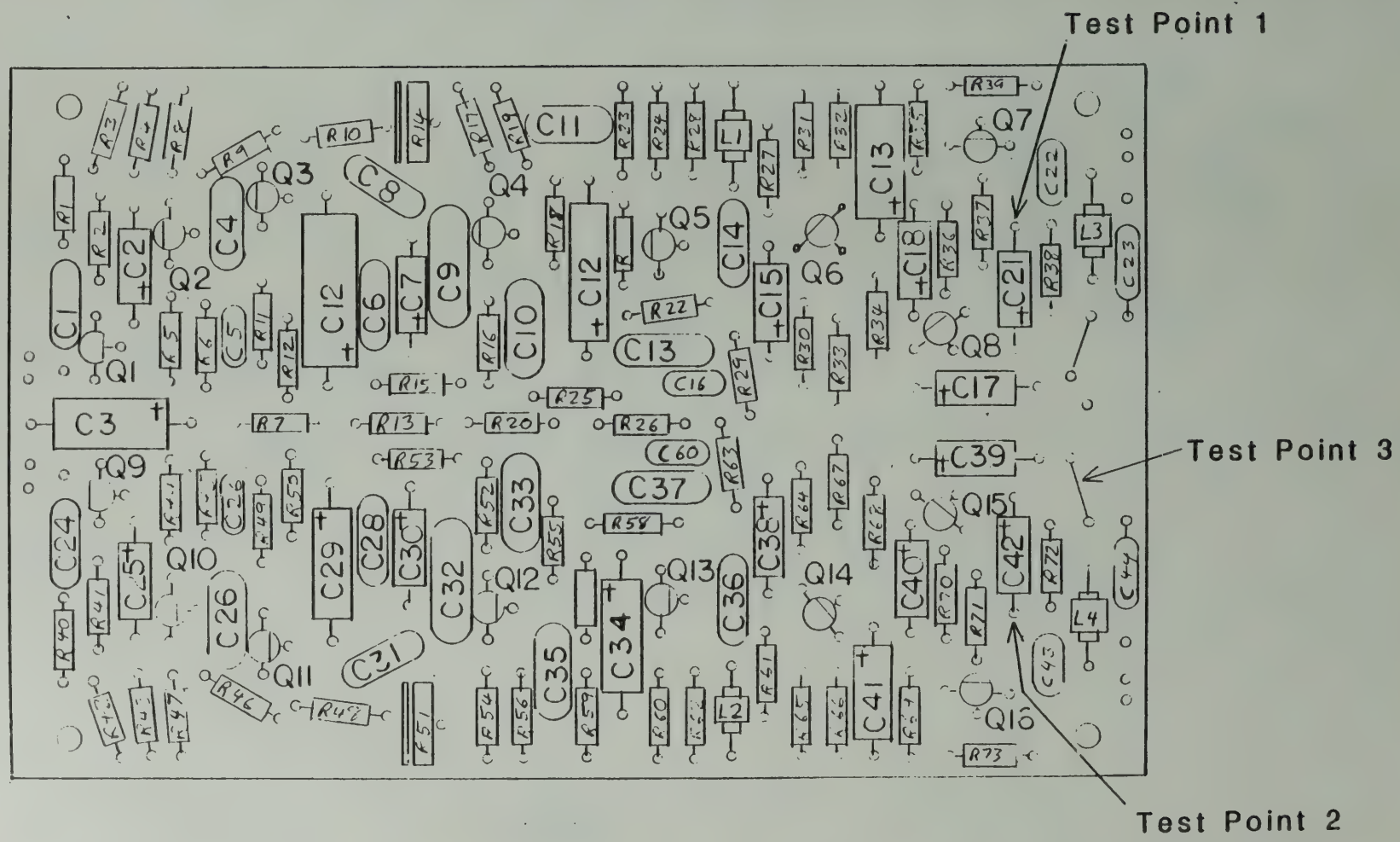
REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
C 43	SAME AS C 22		
C 44	SAME AS C 23		
C 45	CAPACITOR - ELECTROLYTIC, 400 MFD, 50 VDC	82409	
C 46	CAPACITOR - ELECTROLYTIC, 100 MFD, 50 VDC	82408	
C 47	CAPACITOR - MYLAR, .0022 MFD, 600 VDC	82312	
C 48	SAME AS C 47		
C 49	SAME AS C 4		
C 50	SAME AS C 12		
C 51	SAME AS C 2		
C 52	SAME AS C 3		
C 53	CAPACITOR - ELECTROLYTIC, 10 MFD, 25 VDC	82402	
C 54	SAME AS C 3		
C 55	CAPACITOR - MICA, 330 PFD	82506	
C 56	SAME AS C 55		
C 57	CAPACITOR - MICA, 750 PFD	82509	
C 58	SAME AS C 47		
C 59	SAME AS C 12		
C 60	SAME AS C 5		
D 1	DIODE - IN 4003	84101	
D 2	SAME AS D 1		

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
D 3	SAME AS D 1		
D 4	SAME AS D 1		
D 5	DIODE, 2 ENER IN 4750 A	84101	
D 6	SAME AS D 1		
D 7	SAME AS D 1		
D 8	SAME AS D 1		
D 9	SAME AS D 1		
D 10	SAME AS D 1		
Q 1	F.E.T. - MPF 102	84007	MOTOROLA MPF 102
Q 2	TRANSISTOR - GE 2N5232	84002	
Q 3	SAME AS Q 2		
Q 4	TRANSISTOR - GE 2N3858	84003	
Q 5	SAME AS Q 2		
Q 6	SAME AS Q 4		
Q 7	SAME AS Q 4		
Q 8	TRANSISTOR - GE 2N5365	84004	
Q 9	SAME AS Q 1		
Q 10	SAME AS Q 2		
Q 11	SAME AS Q 2		

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
Q 12	SAME AS Q 4		
Q 13	SAME AS Q 2		
Q 14	SAME AS Q 4		
Q 15	SAME AS Q 4		
Q 16	SAME AS Q 8		
Q 17	TRANSISTOR - RCA 2N6292	84005	
Q 18	SAME AS Q 4		
Q 19	SAME AS Q 4		
Q 20	SAME AS Q 4		
Q 21	SAME AS Q 8		
Q 22	SAME AS Q 17		
Q 23	SAME AS Q 17		
IC 1	I.C. - LM 556CN	84203	
OI 1	OPTO INTERRUPTER MODULE - G.E. H22A1	84204	
L 1	CHOKE - 220 UH	87004	
L 2	SAME AS L 2		
L 3	CHOKE - 820 UH	87003	
L 4	SAME AS L 3		
T 1	TRANSFORMER - POWER	87101	
T 2	TRANSFORMER - BIAS	87202	

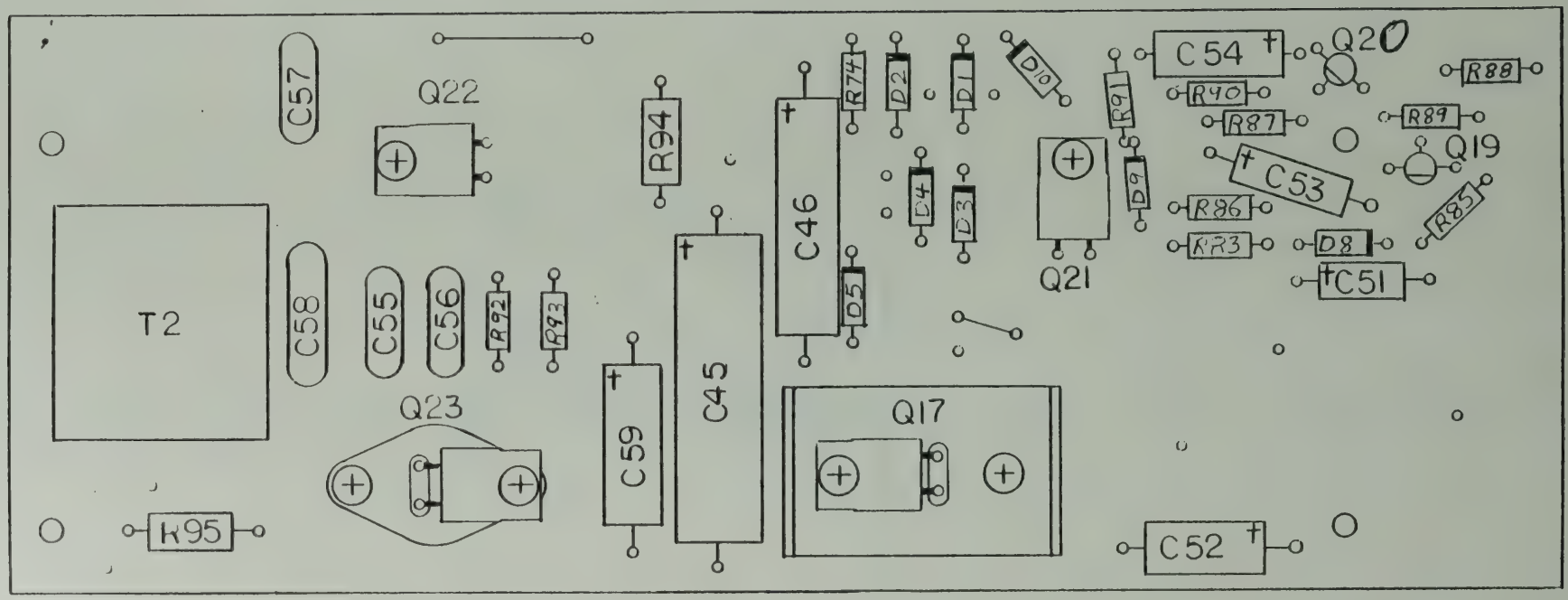
REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
M 1	MOTOR - FAN	87311	BARBER COLMAN AYAA 750-118-4
M 2	MOTOR & DRIVE	87315	FASCO 7162-1037A
SL 1	SOLENOID	87403	DELTROL 51002-83
HS 1	HEAD-REPRODUCE	87714	VICOR VP-3D7A1-B
HS 2	HEAD-RECORD	87715	VICOR VP-ED7T3-B
S 1	SWITCH -ON/OFF	86114	ARROW HART 160011E
P 1	PLUG	85212	MOLEX 03-09-2021
P 2	WAFER	85214	MOLEX 09-60-1081
P 3	PLUG	85208	MOLEX 03-09-2091
P 4	HEAD LEAD	87792	NORTRONICS 139-77
P 5	SAME AS P 4		
P 6	POWER CORD	51201	BELDEN 17236
J 1	RECEPTACLE	85113	MOLEX 03-09-1021
J 2	HOUSING	85126	MOLEX 09-60-7081
J 3	RECEPTACLE	85110	MOLEX 03-09-1091

REFERENCE	DESCRIPTION	RECORDEX PART NO.	MANUFACTURERS PART NO.
	Fan Blade	88705	
	Knob	88402	Alco PKP-194B-¼
	Tape Guide Assembly	89055	
	Capstan Bearing Assembly	89075	
	Take-up Bearing Assembly	89076	
	Replacement Belt Kit (145)	89116	
	Replacement Belt Kit (130)	89117	
	Capstan - Flywheel Assembly (145)	89109	
	Capstan - Flywheel Assembly (130)	89118	
	Cam & Shaft Assembly	89100	
	Cam Bearing	89101	
	Dentent Roller Assembly	89102	
	Felt Washer (Clutch)	47301	
	Clutch Spring (Take-Up & Rewind)	37006	
	Retaining Ring for Clutch Spring	46006	
	Take-Up Shaft & Pulley Assembly (Does not include bearing case)	89103	
	Supply-Rewind Shaft & Pulley Assembly (Does not include bearing case)	89104	
	Pressure Roller Assembly	89054	
	Front Cover	31346	
	Rear Cover	31347	
	Bottom	31348	
	Deck Cover	31349	



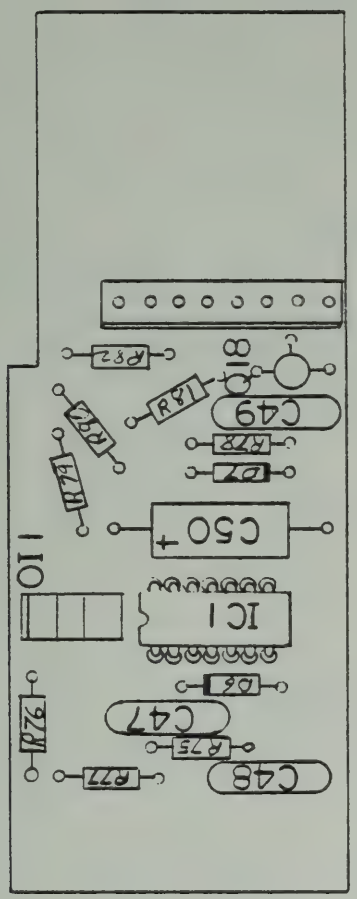
PCB #1 Amplifier - Mixer

(FIGURE 9A)

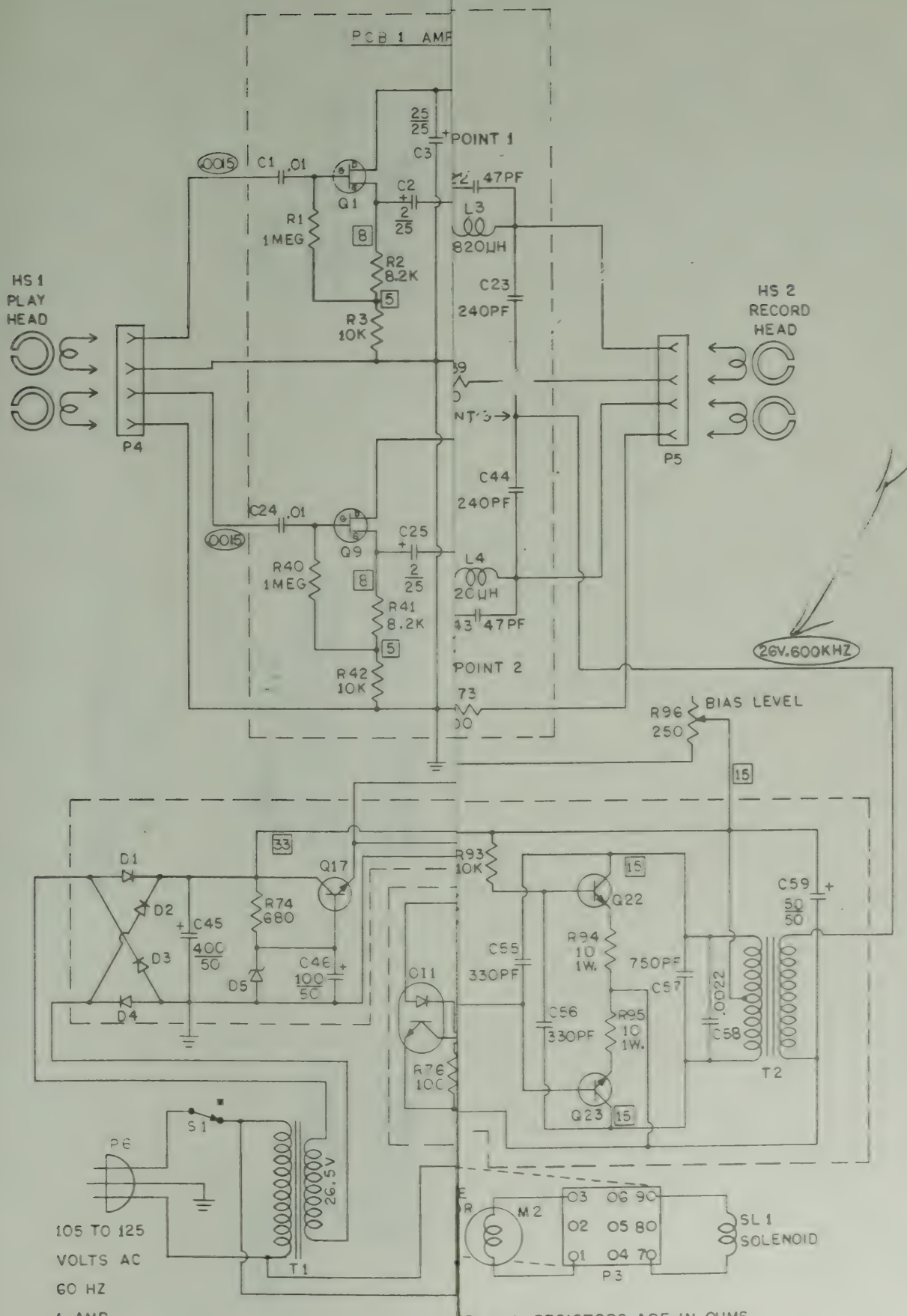


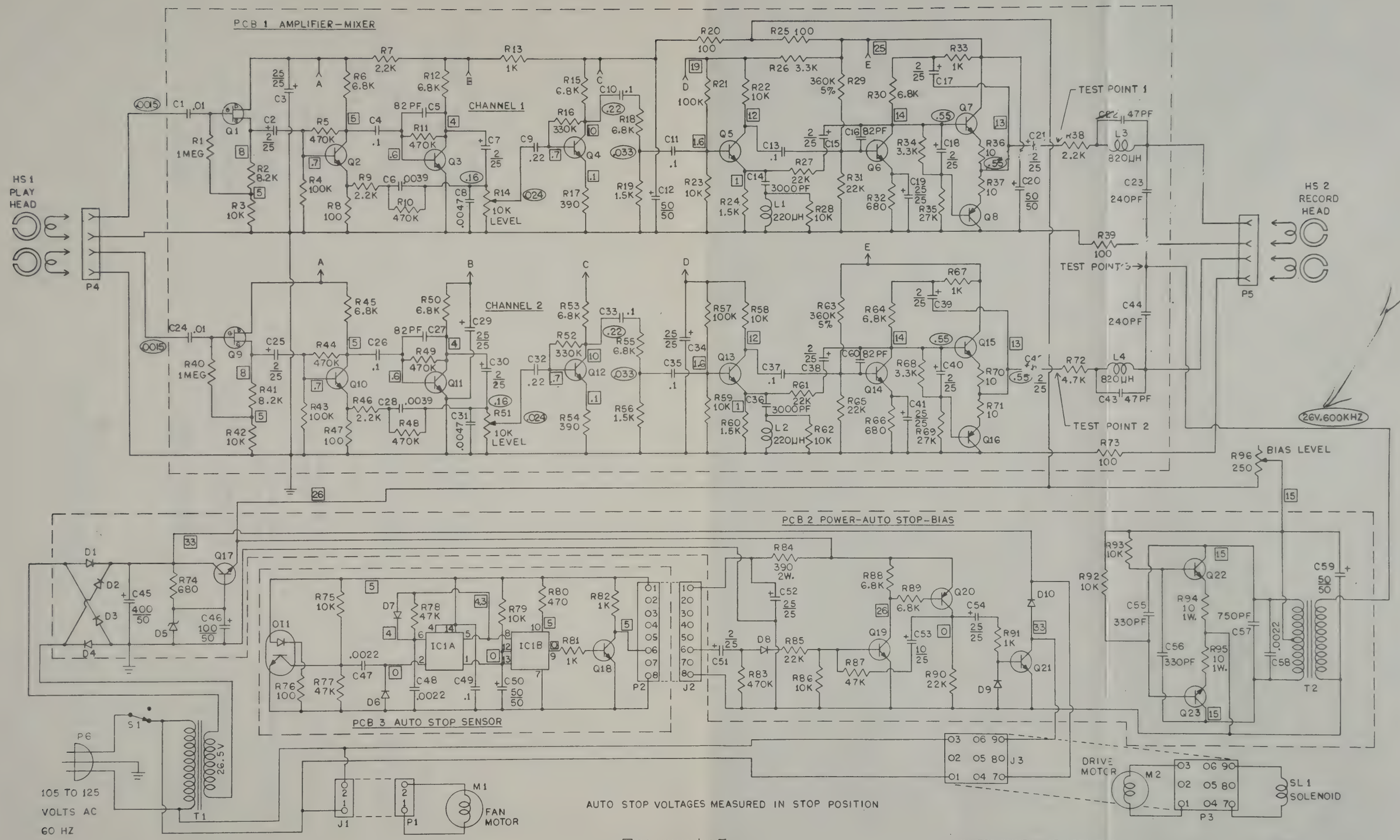
PCB #2 Power Supply - Auto Stop - Bias Supply

(FIGURE 9B)



PCB #3 Auto Stop Sensor
(FIGURE 9C)


PCB 1 AMP
HS 1
PLAY
HEAD
P4
HS 2
RECORD
HEAD
P5
POINT 1
POINT 2
C1 .01
C2
C3
C23
240PF
C44
240PF
C24 .01
C25
R1
1MEG
R2
8.2K
R3
10K
R40
1MEG
R41
8.2K
R42
10K
Q1
Q9
L3
820UH
L4
20UH
47PF
26V.600KHZ
BIAS LEVEL
R96
250
D1
D2
D3
D4
C45
400
50
R74
680
Q17
D5
C46
100
50
R93
10K
Q22
C55
330PF
R94
10
1W.
750PF
C57
C56
330PF
R95
10
1W.
.0022
C58
C59
50
50
T2
Q11
R76
100
Q23
S1
P6
105 TO 125
VOLTS AC
60 HZ
1 AMP.
T1
26.5V
M2
SL 1
SOLENOID
P3
ALL RESISTORS ARE IN OHMS,
ARE IN MICROFARADS.


PCB 1 AMPLIFIER-MIXER
CHANNEL 1
CHANNEL 2
HS 1 PLAY HEAD
HS 2 RECORD HEAD
P4
P5
TEST POINT 1
TEST POINT 2
TEST POINT 3
26V. 600KHZ
BIAS LEVEL
R96 250
R73 100
R39 100
10K LEVEL
PCB 2 POWER-AUTO STOP-BIAS
PCB 3 AUTO STOP SENSOR
IC1A
IC1B
P2
J2
J3
P3
P1
J1
P6
S1
T1
T2
105 TO 125 VOLTS AC 60 HZ 1 AMP.
26.5V
M1
FAN MOTOR
M2
DRIVE MOTOR
SL 1 SOLENOID
AUTO STOP VOLTAGES MEASURED IN STOP POSITION
□ DC VOLTS ±10%
◯ AC VOLTS ±10% : 24 KHZ
UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHMS, ½ W., ± 10%. ALL CAPACITORS ARE IN MICROFARADS.

TROUBLE SHOOTING CHART
(SECTION 11)

SYMPTOM	PROBABLE CAUSE	REMEDY
A. Does not duplicate High Frequencies	Heads out of alignment Bias Level not correct	Align Heads Adjust Bias Level
B. Low Level on Copy (Both Channels)	Heads out of alignment Worn Heads	Align Heads Replace Heads
C. Low Level on Copy (One Channel)	Level Control out of adjustment	Adjust Level Control
D. Distorted Recordings	Bias Level not correct	Adjust Bias Level
E. Auto Stop Does Not Work	Defective Opto Interrupter Defective LM556CN	Replace Opto Interrupter Replace LM556CN
F. Flutter	Defective Pinch Roller Worn Drive Belt Worn Capstan Shaft Worn Capstan Bearings	Replace Pinch Roller Replace Belt Replace Capstan Shaft Replace Capstan Bearings